

CLAIMS

1. A method of treating household waste comprising the steps of:

5 (a) separating any non-biodegradable waste above a predetermined size from the household waste for subsequent disposal;

(b) shredding the remaining household waste in a shredder;

10 (c) mixing the shredded household waste with an alkali solution to form an alkali and household waste mixture having a pH above 11.5;

(d) separating any remaining metallic waste from the alkali and household waste mixture for subsequent disposal;

15 (e) separating any wood or plastics material from the alkali and household waste mixture for subsequent disposal;

(f) removing any gases emitted by the alkali and household waste mixture;

20 (g) subjecting the alkali and household waste mixture to a centrifuge to form sludge cake having a liquid content of between 60% and 95%, and untreated water; and

25 (h) mixing the sludge cake with a dry mix of aggregate and cement to form a concrete mixture.

2. A method of treating household waste as claimed in claim 1, in which the step of separating any remaining metallic objects from the alkali and household waste mixture for subsequent disposal further comprises passing the alkali and household waste mixture through an eddy magnet.

3. A method of treating household waste as claimed in claim 1 or 2, in which the step of separating any wood or plastics material from the alkali and household

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waste mixture for subsequent disposal comprises passing the alkali and shredded household waste mixture through a floatation tank and skimming the wood and plastics material from the floatation tank.

- 5 4. A method of treating household waste as claimed in any preceding claim, in which the further step is carried out of passing the untreated water to a water treatment plant for sanitation and recycling.
- 10 5. A method of treating household waste as claimed in any preceding claim, in which the additional step is carried out of pouring the concrete mixture into plastic containers to prevent inadvertent leaching of contaminants from the concrete mixture.
- 15 6. A method of treating household waste as claimed in any preceding claim, in which the gases removed from the alkali and household waste mixture are passed to a burner for burning.
- 20 7. A method of treating household waste as claimed in any preceding claim, in which the step of mixing the shredded household waste with an alkali solution further comprises mixing the household waste with an alkali solution having a pH equal to or above 12.5.
- 25 8. A method of treating household waste as claimed in claim 7, in which the alkali solution has a pH above 13.
- 30 9. A method of treating household waste as claimed in claim 7 or 8, in which the alkali solution has a pH above 13.5.
- 35 10. A method of treating household waste as claimed in any preceding claim, in which the sludge cake is added in sufficient quantities so that the sludge cake forms between 5% and 50% by weight of the concrete mixture.
- 40 11. A method of treating household waste as claimed in claim 10, in which the sludge cake is added in sufficient quantities so that the sludge cake forms

between 10% and 40% by weight of the concrete mixture.

12. A method of treating household waste as claimed in claim 10 or 11, in which the sludge cake is added in sufficient quantities so that the sludge cake forms between 15% and 30% by weight of the concrete mixture.
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13. A method of treating household waste as claimed in any preceding claim, in which the aggregate and cement are mixed together in a separate container prior to mixing with the sludge cake.
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14. A method of treating household waste as claimed in any preceding claim, in which the step of mixing the household waste with an alkali solution further comprises mixing the household waste with a concrete hardener.
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15. A method of treating household waste as claimed in any preceding claim, in which the additional step is carried out of adding a bonding agent to the concrete mix.
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16. A method of treating household waste as claimed in claim 15, in which the bonding agent has a pH in the region of 8 to 11.
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17. A method of treating household waste as claimed in any preceding claim, in which the aggregate comprises one or more of grey wacke stone, sand, sandstone, gravel, limestone, crushed shale, crushed seashells, pencil, kiln dried sand, grit, pulverised fuel ash, slag from steelworks, and recycled crushed concrete.
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18. A method of treating household waste as claimed in any preceding claim, in which the method further comprises the additional step of allowing the concrete mixture to set and after a predetermined length of time, crushing the concrete mixture for subsequent re-use as an aggregate in the method.
19. A method of treating household waste as claimed in any preceding claim, in which the method further comprises the step of adding water to the concrete

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mixture, on addition of the sludge cake to the cement and aggregate mixture.

20. A method of treating household waste as claimed in any preceding claim, in which the method further comprises the step of adding a detergent to the concrete mixture prior to curing.
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21. A method of treating household waste as claimed in any of claims 1 to 9, in which the sludge cake, cement and aggregate are mixed in a ratio of 1:1:6 by weight to form the concrete mixture.
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22. A method of treating household waste as claimed in any preceding claim, in which the method further comprises the step of milling the household waste prior to separating any wood or plastics material therefrom.
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23. A method of treating household waste as claimed in any preceding claim, in which the step of mixing the sludge cake with the cement and aggregate to form a concrete mixture is performed in the mixing drum of a concrete mixing truck.
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24. A method of treating household waste as claimed in any preceding claim, in which the sludge cake has a solids content of between 10 and 40%.
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25. A method of treating household waste as claimed in claim 26, in which the sludge cake has a solids content of between 10 and 25%.
26. A method of using household waste in the production of concrete comprising the steps of mixing cement, aggregate and household waste together to form a concrete mix, characterized in that the method further comprises the initial steps of:
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 - (f) shredding the household waste to a predetermined particle size;
 - (g) mixing an alkali solution with the shredded household waste to form an alkali and household waste mixture having a pH equal to or

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greater than 11.5, prior to mixing with the cement and the aggregate.

27. A method of using household waste in the production of concrete as
5 claimed in claim 26 in which the alkali solution is added to the shredded
household waste so that the alkali and household waste mixture has a liquid
content by weight of between 60% and 90%.
28. A method of using household waste in the production of concrete as
10 claimed in claim 26 or 27 in which the alkali solution is added to the
shredded household waste so that the alkali and household waste mixture
has a liquid content by weight of between 75% and 90%.
29. A method of using household waste in the production of concrete as
15 claimed in claim 26 or 27 in which the method further comprises the steps
of :
 - (h) passing the alkali and household waste mixture through a centrifuge
20 to separate the alkali and household waste mixture into sludge cake
having a liquid content by weight of between 60% and 90%, and
untreated wastewater;
 - (i) drawing off the untreated wastewater and leaving only the sludge
cake; and
 - 25 (j) mixing the sludge cake with the cement and aggregate mixture.
30. A method of using household waste in the production of concrete as
30 claimed in claim 29 in which the alkali and household waste mixture are
passed through a centrifuge until the sludge cake has a liquid content of
between 75% and 85%.
31. A method of using household waste in the production of concrete as
claimed in any of claims 26 to 30 in which the household waste is shredded

to provide a shredded household waste having an average particle size of between 1mm and 10mm.

32. A method of using household waste in the production of concrete as claimed in claim 31 in which the household waste is shredded to provide a shredded household waste having an average particle size of between 3mm and 8mm.
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33. A method of using household waste in the production of concrete as claimed in any of claims 26 to 32 in which the alkali solution added to the household waste is a concrete hardener.
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34. A method of using household waste in the production of concrete as claimed in any of claims 26 to 33 in which the method further comprises the step of adding a bonding agent to the concrete mix.
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35. A method of using household waste in the production of concrete as claimed in any of claims 26 to 34 in which the step of adding an alkali solution to the shredded household waste further comprises the step of adding an alkali solution having a pH equal to or above 12.5.
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36. A method of using household waste in the production of concrete as claimed in any of claims 26 to 35 in which the alkali and household waste mixture comprises between 5 and 50% by weight of the concrete mixture.
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37. A method of using household waste in the production of concrete as claimed in claim 36 in which the alkali and household waste mixture comprises between 10% and 40% by weight of the concrete mixture.
38. A method of using household waste in the production of concrete as claimed in claim 36 or 37 in which the alkali and household waste mixture comprises between 15% and 30% by weight of the concrete mixture.
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39. A method of using household waste in the production of concrete as

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claimed in any of claims 26 to 35 in which the alkali and household waste mixture, cement and aggregate are mixed in the ratio 1:1:6 by weight to form the concrete mixture.